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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,072	02/01/2002	Peter Jivan Shah	010139	2527

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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
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EXAMINER	
CHOW, CHARLES CHIANG	

ART UNIT	PAPER NUMBER
2685	9

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/066,072	SHAH, PETER JIVAN	
	Examiner	Art Unit	
	Charles Chow	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6, 8-15, 17-24, 26-29, 31-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-15,17-24 and 26-31* is/are rejected.

7)☒ Claim(s) *32-34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Office Action for Amendment
Received on 2/4/2004

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 11, 20, are rejected under 35 U.S.C. 102(e) as being anticipated by Takada (US 2002/0155,812 A1).

Regarding **claim 1**, Takada teaches a system for reduction of distortion (removing interference signal in reception signal, abstract, Fig. 1, Fig. 19-20) in a wireless communication circuit (Fig. 20) having a combined signal (FM interference wave signals inside desired CDMA signal band [0027], Fig. 19, [0227]) including a desired signal (CDMA signal) and a jammer signal (FM interference wave signal) comprising a filter (adaptive filter 152, Fig. 20, [0029-0036]) to remove the desired signal [0072] and thereby provide a filtered signal representative of the jammer signal ([extract only interference component in [0072]), an adder circuit (153) to receive the combined signal (DS/CDMA + FM) and the filtered signal (FM signal) to thereby remove the jammer signal (FM signal), the adder circuit (153) comprises a positive ("+" for 153 in Fig. 20) and negative input ("-" for 153 in Fig. 20), the combined signal being coupled to the positive input (Fig. 20), and the filtered signal being coupled to the negative input (Fig. 20).

Regarding **claim 11**, Takada teaches a circuit for reduction of distortion ((removing interference signal in reception signal, abstract, Fig. 1, Fig. 19-20) in a communication circuit (fig. 20) having a combined signal including a desired signal and a jammer signal (the FM interference wave signals inside desired CDMA signal [0027], Fig. 19, [0227]), comprising means for filtering the combined signal (adaptive filter 152, Fig. 20, [0029-0036] to remove the desired signal [0072])and thereby provide a filtered signal representative of the jammer signal ([extract only interference component in [0072]), means for adding the combined signal (DS/CDMA + FM) to remove the jammer signal (FM signal), comprising coupling the combined signal (CDMA signal plus Fm signal) to the positive input (Fig. 20), and the filtered signal (FM signal) being coupled to the negative input (Fig. 20).

Regarding **claim 20**, Takada teaches a method for reduction of distortion (removing interference signal in reception signal, abstract, Fig. 1, Fig. 19-20) in a wireless communication circuit (Fig. 20) having a combined signal (FM interference wave signals inside desired CDMA signal band [0027], Fig. 19, [0227]) including a desired signal (CDMA signal) and a jammer signal (FM interference wave signal), the method comprising filtering the combined signal (adaptive filter 152, Fig. 20, [0029-0036]) to remove the desired signal [0072] and thereby provide a filtered signal representative of the jammer signal ([extract only interference component in [0072]), adding the combined signal (DS/CDMA + FM) and the filtered signal (FM signal) to thereby remove the jammer signal (FM signal), the adder circuit (153) comprises coupling the combined signal to the positive input (Fig. 20), and coupling the filtered signal to the negative input (Fig. 20).

2. Claims 14, 29, 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Tolson et al. (GB 2,343,572).

Regarding **claim 14**, Tolson teaches a circuit for reduction of distortion in a receiver (Fig. 5, page 4, third and fourth paragraph), configured to receive a radio frequency rf signal at a selected rf (antenna and filter 1, Fig. 5), the received rf signal being a combined signal containing a desired signal and a jammer signal (unwanted signal residing in the received signal with desired signal), a down converter (3, 6) to selected low frequency (14-15), the circuit comprising means for filtering the combined signal at the selected low frequency to remove desired signal (filter 10-11 at the output 8-9, Fig. 5, page 5 first paragraph, the unwanted are passed and the desired are rejected), means for converting the filtered signal to the selected rf signal (mixer 12, oscillator 7), means for adding the received rf signal and the filtered rf signal to remove the jammer signal (items 13, 16-17, 18-19, 5 in Fig. 5), coupling the received rf signal to the positive input of an adder (at input to 18) and coupling the filtered signal to a negative input of the adder (at input to 13). Tolson teaches the negative terminal at adder. The adder components, items 18 19, 5, 17, 13, 16 in Fig. 5, are for adding the received combined signal at 18 with the 180 phase shifted unwanted signal at the input of 13, page 5 line 1 to page 7 line 7 from top. The output signal from mixer 12 is connected to the negative input terminal at the input of phase inverter 13 in Fig. 5 for removing the unwanted jammer signal by utilizing adder (18 19, 5, 17, 13, 16 in Fig. 5).

Regarding **claim 29**, Tolson taught above in claim 14, a system for reduction of distortion in a wireless communication circuit having a combined signal including desired signal and a jammer signal, a radio frequency stage, an adder, a mixer, a filter, an up mixer with wireless

quadratures (I, Q 8-9, page 4, third paragraph), a splitter (inside mixer 6 for splitting signal to 8, 9), the mixer comprising first and second mixer cores (two mixers in 6) and oscillator 7, the filter 10-11, the upmixer comprising first and second mixer (two mixers in 12), a summer (the adder components, items 18 19, 5, 17, 13, 16 in Fig. 5, are for adding the received combined signal at 18 with the 180 phase shifted unwanted signal at the input of 13. The output signal from mixer 12 is connected to the negative input terminal at the input of phase inverter 13 in Fig. 5 for removing the unwanted jammer signal by utilizing adder (18 19, 5, 17, 13, 16 in Fig. 5).

Regarding **claim 31**, Tolson taught a system for reduction of distortion in a wireless communication circuit (Fig. 5, GSM in page 4 fourth paragraph) having a combined signal including a desired signal and a jammer signal (unwanted signal in received signal), a radio frequency stage having a input configured to receive an Rf signal (Fig. 5, antenna, 1) and an output (output from filters 14-15), an adder (13, 16-17, 18-19, 5, Fig. 5) having first input (input to 18, Fig. 5) and second input (input to 13, Fig. 5) and output (output from 5, Fig. 5), a mixer (6) having input from 5 and outputs (8, 9) and oscillator (7) connected to mixer 6, a filter 10-11 coupled to the mixer output, and upmixer (12) having input from filters 10-11, and mixer output is connected to 13 of the second adder input at 13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the

manner in which the invention was made.

3. Claims 2-6, 8-13, 15, 17-19, 21-24, 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada in view of Tolson et al. (GB 2,343,572).

Regarding **claim 2**, Tolson teaches the RF receiver (Fig. 5) receiving unwanted signal and the desired signal (unwanted signal in the received signal, title, abstract, Fig. 1-8; page 2, last paragraph to page 3, first paragraph). Tolson teaches the mixer (6) coupled to the adder (summer 5, figure in cover page), to convert RF to lower frequency, with high pass filters 10-11 for reject the desired signal, as shown above, page 5, first paragraph). Tolson teaches the up mixer 12 (as shown above for converting (figure in cover page) the filtered signal to the selected RF (page 5, second and third paragraphs) for subtracting unwanted at summer 5. Tolson teaches feedback for removing unwanted signal inside the received signal for plurality of different bandwidth, multi-mode capability for a receiver (page 1 last paragraph to page 2 second paragraph from bottom line). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Takada above, and to include

Tolson's feedback up conversion for removing unwanted signal for different bandwidth, such that the receiver could be utilized for different bandwidth and multi-mode capability.
Regarding **claim 3**, Tolson taught above the GSM communication receiver is a quadrature circuit (I, Q output 8, 9) and quadrature mixer 6. Tolson also teaches the first and second filter 10, 11 (figure in cover page), the first and second quadrature up mixers in 12. Tolson

taught the summer coupled to first and second quadrature up mixer (12) having the combined converted first and second signal portions inside mixer 12.

Regarding **claim 4**, Tolson taught above a receiver for receiving rf signal with the desired and unwanted signals. Tolson taught above a down-mixer (6) for converting rf signal to a selected lower frequency. Tolson taught the filters 10-11 operating at selected lower frequency to reject desired signal. Tolson taught an up-mixer (12) and adder (items 18 19, 5, 17, 13, 16 in Fig. 5, for adding received combined signal from mixer 13 with the 180 degree phase inverted signal from 13. The output signal from mixer 12 is connected to the negative terminal at the input of phase inverter 13, Fig. 5) for removing the unwanted jammer signal by utilizing adder (18 19, 5, 17, 13, 16 in Fig. 5).

Regarding **claim 5**, Tolson taught a GSM receiver circuit (Fig. 5, Fig. 1-4, Fig. 6-8) is a quadrature circuit (I,Q baseband outputs 8-9, page 4, third paragraph), a quadrature mixer core (6), the first mixer 3, the second mixer 6, the first and second high pass filters 10-11, the up-mixer 12 for quadrature up conversion.

Regarding **claim 6**, Tolson taught the splitting the combined converted signal into two quadrature signal I, Q (8, 9, page 4 third paragraph, page 5 first paragraph), the adder circuit comprising fist and second adder portion for adding first split signal, and the combined signal, and the second split signal and the combined signal (the two inputs to summer 5, page 5 third paragraph).

Regarding **claim 8**, Tolson taught the base band I, Q at 8-9 (as shown above) and the high pass filters 10-11 (above).

Regarding **claim 9**, Tolson taught the analog filter (active filters, page 6 lines 5-6).

Regarding **claim 10**, Tolson taught the wireless communication unit has specified operational bandwidth (page 4, fourth paragraph, GSM 25 MHz), and filter has filter bandwidth based on the operational bandwidth (page 6, line 10-12).

Regarding **claim 11**, Tolson taught the receiver circuit for canceling of the unwanted signal from the combined received signal. Tolson taught the means for filtering to reject desired signal and to select unwanted jammer signal. Tolson taught the adder (summer 5/8) for removing the unwanted jammer signal by adding the combined signal and filtered signal.

Regarding **claim 12**, Tolson taught a receiver and the received RF of combined signal with desired and unwanted signal. Tolson taught the down converted selected low frequency, the means for filtering by 10-11, the upconverting to selected RF by mixer 12, the means for adding at summer 5/8 desired and jammer with filtered signal at summer 5.

Regarding **claim 13**, Tolson taught the quadrature communication circuit, the mixer 3/6, the means for filtering, the means for converting to selected rf. Andersen has shown above the combining the converted first and second signal.

Regarding **claim 15**, Tolson taught the quadrature communication circuit, the quadrature down conversion 6 for a selected lower frequency, the means for filtering, the means for converting to selected rf. Tolson taught the combining of the converted first and second signal in item 12 (Fig. 5).

Regarding **claim 17**, Tolson taught the base band I, Q at 8-9 (as shown above) and the high pass filters 10-11 (above).

Regarding **claim 18**, Tolson taught the analog filter (active filters, page 6 lines 5-6).

Regarding **claim 19**, Tolson taught the wireless communication unit has specified operational bandwidth (page 4, fourth paragraph, GSM 25 MHz), and filter has filter bandwidth based on the operational bandwidth (page 6, line 10-12).

Regarding **claim 21**, Tolson taught the method for receiving a rf signal at selected rf with combined signal of desired and unwanted. Tolson has shown above the converging the added signal to low frequency at mixer 6 coupled to filters 10-11. Tolson has shown above the converting the filtered signal to selected rf at mixer 12 outputs for sending signal to the adding at summer 5 to add the received desired and unwanted with the filtered converted signal.

Regarding **claim 22**, Tolson taught the method for receiving a rf signal at selected rf with combined signal of desired and unwanted. Tolson has shown above the converging the added signal to low frequency at mixer 6 coupled to filters 10-11. Tolson has shown above the converting the filtered signal to selected rf at mixer 12 outputs for sending signal to the adding at summer 5 to add the received rf and the filtered rf signal to cancel the unwanted jammer signal.

Regarding **claim 23**, Tolson taught the wireless communication GSM receiver is a quadrature circuit for converting rf signal to first and second quadrature components at selected frequency (as shown above).Tolson taught the I/Q high pass filters 10-11 and the up conversion mixer 12. Tolson taught the combining of the upconverted signals in 12 (Fig. 5).

Regarding **claim 24**, Tolson taught the splitting the combined converted signal into two quadrature signal I, Q (8, 9, page 4 third paragraph, page 5 first paragraph), the adder circuit comprising fist and second adder portion for adding first split signal, and the combined

signal, and the second split signal and the combined signal (the two inputs to summer 5, page 5 third paragraph).

Regarding **claim 26**, Tolson taught the base band I, Q at 8-9 (as shown above) and the high pass filters 10-11 (above).

Regarding **claim 27**, Tolson taught the analog filter (active filters, page 6 lines 5-6).

Regarding **claim 28**, Tolson taught the wireless communication unit has specified operational bandwidth (page 4, fourth paragraph, GSM 25 MHz), and filter has filter bandwidth based on the operational bandwidth (page 6, line 10-12).

Claims Objection

4. Claims 32-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Because the prior art does not teaches the claimed features for the four way splitter.

Response to Arguments

5. Applicant's arguments with respect to claims 1-6, 8-15, 17-24, 26-31 have been considered but are moot in

view of the new ground(s) of rejection.

Regarding applicant's amendment for the no teachings of the negative terminal at adder. Tolson teaches the negative terminal at adder. The adder components, items 18 19, 5, 17, 13, 16 in Fig. 5, are for adding the received combined signal at 18 with the 180 phase shifted unwanted signal at the input of 13 (page 5 line 1 to page 7 line 7 from top). The output signal from mixer 12 is connected to the negative input terminal at the input of phase inverter 13 in

Fig. 5 for removing the unwanted jammer signal by utilizing adder (18 19, 5, 17, 13, 16 in Fig. 5). In view of the above cited references, claims 1-6, 8-15, 17-24, 26-31 are remaining in the rejection manner.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (703)-306-5615.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)-305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Charles Chow C.C.

April 1, 2004.

EDWARD F. URBAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600